IMPACT OF ARTIFICIAL INTELLIGENCE COURSE ON LIFE SKILLS, COLLABORATIVE SKILLS AND ETHICAL AWARENESS OF SECONDARY SCHOOL STUDENTS

A

Synopsis

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INTRODUCTION

The term artificial intelligence was coined in 1956, but artificial intelligence has become popular nowadays, it is all due to increased data volumes, improvements in computing power and storage and advanced algorithms. Artificial Intelligence (AI) is the branch of computer science which is concerned with building smart machines with capability to perform tasks which typically require human intelligence.

CBSE has introduced Artificial Intelligence as an elective subject at Class IX from the Session 2019-2020 onwards and has been conducting trainings for Teachers on how to use AI in the Classroom. A Training Video has also been prepared to assist the same.

The curriculum for the subject is developed from scratch by a team from IBM India along with members of its global team and other subject experts. The curriculum for the subject includes teaching knowledge and skills on AI, and also includes chapter on ethics including issues of security, privacy and transparency. The curriculum requires 36 hours of school time for completion.[20]

In keeping with the vision of CBSE to introduce and train Teachers on AI readiness, and the usage of AI in classroom teaching and learning practices; a discussion was initiated with AI experts and Teachers of various subjects from CBSE Schools. Lesson Plans in each Subject were discussed and written, and a suggestive list of activities and projects integrating Artificial Intelligence into regular subject teaching was curated and compiled for reference, as an AI Glossary, which accompanied each Lesson Plan to facilitate ease of reference and usage.

The impact of artificial intelligence is already visible in the world economy and has captured the attention of many analysts. The largest investment ever made by Google in the European Union is the acquisition in 2014 of Deep Mind technologies, with $400 million. Deep Mind Technologies, now named Google Deep Mind, is a London-based artificial intelligence startup specialized in machine learning and advanced algorithms. Notably, Google also made significant investments in the German Research Centre for Artificial Intelligence, which is, according to their website, “the biggest research center worldwide in the area of Artificial Intelligence and its application, in terms of number of employees and the volume of external funds” (DFKI 2015).

LIFE SKILLS

Nowadays “Life Skills Education” is being imparted in schools affiliated to the Central Board of Secondary Education (CBSE). Life Skills assist adolescent to face the challenges of everyday life in better way. Educating life skills means boosting all domains of the learners such as **Self Awareness, Empathy, Critical Thinking, Creative Thinking, Decision Making, Problem Solving, Effective Communication, Interpersonal Relationships, Coping with Stress and Coping with Emotions.**

Life skills are ‘abilities for adaptive behavior that enable individuals to deal effectively with the demands and challenges of everyday life’ (WHO, 1997).Life skills education can be seen as empowering children and thus enabling them to take more responsibility for their actions (Orley, 1997).

The Inter-Agency Meeting on Life Skills Education was held at WHO headquarters, Geneva, Switzerland on 6 and 7 April 1998. The WHO Department of Mental Health identified five basic areas of life skills that are relevant across cultures:

- Decision-Making and Problem-Solving;
- Creative Thinking and Critical Thinking;
- Communication and Interpersonal Skills;
- Self-Awareness and Empathy;
- Coping with Emotions and Coping with Stress.[22]

COLLABORATIVE SKILLS

Collaborative or Collaboration skills enable people within an organization (or outside an organization) to engage with each other productively and efficiently.[5] Collaboration skills play an important role in the completion of project work done by the students together effectively and efficiently. Knowing how to cooperate well with others will support project efficiency and achievement of better outcomes.

To help to boost collaboration skills and improve effectiveness in the work, here are some helpful information, examples and a few useful tips.

Collaboration Skills Examples

Here are two examples of collaborative working:

Example 1: Brainstorming as a group

Getting involve together to perform as a team to share ideas and ask questions from each other is a great opportunity for collaboration. By getting ideas from several people, one can leverage multiple areas of expertise.

Example 2: Open discussion and Collaborative work

Open discussion gives an opportunity to each member of the group an opportunity to contribute and ensures all ideas are respected and valued. Instead of one person lecturing in group meeting, collaborative discussion requires each member of group to participate and share their thoughts and opinions. When all the member of the group has a stake in the discussion, meetings becomes more productive.[9]

TYPES OF COLLABORATIVE SKILLS

There are following types of collaborative skills:

- Analyzing Problem Without Assigning Blame
- Assessing The Strength And Weaknesses Of Team Members
- Brainstorming
- Compromising
- Defining Mutually Acceptable Roles
- Delegation
- Time Management
- Resource Management
- Leadership
- Managing Deadlines
- Assigning Roles
- Documenting Team Progress
- Recognizing And Rewarding Group Achievements
- Innovation
- Organization[5]

ETHICAL AWARENESS

Artificial Intelligence (AI) is a science which employs strong approaches, methods, and techniques to solve unsolvable real-world based problems. Because of its expected boom in the future, there are also some discussions about its ethics and safety. Shaping an Artificial Intelligence (AI)-friendly environment for people and a people-friendly environment for AI can be a possible answer for finding a shared context of values for humans and robots both. In this context, the ethical awareness of AI and the moral dilemmas that arise from ethical algorithms, from pre-set or acquired values must be taken into consideration. Analyzing the concerns and potential solutions to solve the ethical issues presented and to increase readers' awareness on AI safety. AI ethics deals with ways of deviation or distancing oneself from problematic routines of action, with uncovering blind spots in knowledge, and of gaining individual self-responsibility.

EMERGENCE AND JUSTIFICATION OF THE PROBLEM

Artificial Intelligence (AI) is now enhancing tools and instruments used in campuses around the world. From Internet search engines, smartphone features and apps, to public transport and household appliances. For example, the complex set of algorithms and software that power iPhone's Siri is atypical example of artificial intelligence solutions that became part of everyday experiences (Bostrom and Yudkowsky 2011; Luckin 2017).

UNICEFF and WHO have done various efforts in the direction of life skills education all over the world. In 1991, United Nation's Educational Scientific and Cultural Organization had suggested to include life skills training in school education program as prevention program.

An emerging trend in classrooms is the use of networked visual argumentation tools that allow students to discuss, debate, and argue with one another in a synchronous fashion about topics presented by a teacher. These tools are aimed at teaching students how to discuss and argue, important skills not often taught in traditional classrooms. (Mclaren and Scheuer 2010)

Making school students 'AI Aware' or forging 'AI Readiness' among students is a huge task indeed. Central Board of Secondary Education under the guidance of Ministry of Human Resource Development has taken a **'twin initiative'** in this regard. **First** is to introduce AI as an elective subject in classes VIII, IX and X. To begin with, schools have to apply to CBSE and be approved to run this course. AI

curriculum for classes VIII and IX has been chalked out and a Facilitators' Handbook has been produced. CBSE is also supporting extensive teacher training for the teaching of AI in schools. The **Second** part of CBSE initiative deals with the premise that AI is a Cognitive Science which can be linked to various subjects that concern themselves with cognition and reasoning. Almost every one of the school subjects would fall in this domain. Be it - Mathematics, Computing, Neuro-Sciences, Psychology, Physics, Economics, Sociology, Philosophy, Languages and some others. It is, therefore, mandated by CBSE that all its schools would begin to integrate AI with other disciplines from classes I -XII.[3]

RESEARCH QUESTIONS

The research questions of the study are as follows:

1. What is the role of artificial intelligence course in developing the life skills among the secondary school students?
2. What is the role of artificial intelligence course in developing collaborative skills among the secondary school students?
3. What is the role of artificial intelligence course in developing ethical awareness among the secondary school students?
4. To what extent is the artificial intelligence course useful for the students in the future?
5. What is the opinion of the teachers, parents and administrators regarding artificial intelligence course of secondary school students?

STATEMENT OF THE PROBLEM

The proposed investigation is titled "IMPACT OF ARTIFICIAL INTELLIGENCE COURSE ON LIFE SKILLS, COLLABORATIVE SKILLS AND ETHICAL AWARENESS OF SECONDARY SCHOOL STUDENTS".

REVIEW OF RELATED LITERATURE

Review of related literature is the process of collecting, selecting, and reading books, journals, reports, abstracts, and other reference materials. The following information may be collected:

1. Background information related to the problem and concepts.

2. Theories which helps in explaining the existence of the problem and the possible connection between certain factors and the problem

3. Data that confirms the existence and seriousness of the problem

4. Specific and general findings of studies related to the problem

5. Recommendations for further study given in related studies[17]

The studies related to artificial intelligence, life skills, collaborative skills and ethical awareness of artificial intelligence have been summarized in the following table -

Table 1.Studies related to Artificial Intelligence, Life Skills, Collaborative Skills and Ethical Awareness of AI

S. No	Year	Researcher	Research Topic	Findings
1.	2020	ThiloHagendorff	The ethics of AI ethics: An evaluation of guidelines	This study helps in finding out, to what extent the respective ethical principles and values are implemented in the practices of research, development and application of AI systems – and how the effectiveness in the demands of AI ethics can be improved.
2.	2019	Mandeep Kaur	Life skills among senior secondary school students in relation to their family environment school environment and socio economic status	This study concludes - 1. Significant difference exists between the life skills of female and male students of senior secondary schools. 2. Significant difference exists between the life skills of rural and urban students of senior secondary schools. 3. Significant difference exists between the life skills of the students studying in government and private senior secondary schools.
3..	2017	Stefan A. D. Popenici and Sharon Kerr	Exploring the impact of artificial intelligence on teaching and learning in higher education	This study concludes that - AI solutions open a new horizon of possibilities for teaching and learning in higher education. However, it is important to admit the current limits of technology and admit that AI is not (yet) ready to replace teachers, but is presenting the real possibility to augment them.

4.	2015	Revathi D	Effect of Collaborative Learning on Learning Outcomes of Students with Special Needs in Inclusive School	The finding of the study - 1. Collaborative Learning strategy enhanced the academic performance of students in different categories viz., Non - disabled peers, Students with Special Needs & Students with Cognitive Impaired. 2. Collaborative learning was found to be effective in enhancing the academic performance of students with special needs (pre mean =58; post mean=63)
5.	2014	Prasanthkumar, N.	Perceptions of life skills achievement and guidance needs among adolescent students of Kerala from a school social work perspective with special reference to higher secondary level	Highly significant relationship is observed between life skills achievement and guidance needs, where the two variables of the current study – life skill achievement and guidance needs, are found to be inversely associated.
6.	2010	Bruce M. Mclaren and Oliver Scheuer	Supporting Collaborative Learning and E – Discussions Using Artificial Intelligence Techniques	This study concludes that, while obtained with relatively small sample sets and thus not providing a conclusive answer to the main research question, indicate that it is very likely that automated analysis of contributions and patterns in student e-discussions is possible.
7.	2010	Amrita Pritinanda	Effectiveness of the collaborative learning strategy in teaching English at secondary school stage	This study concludes that, the collaborative learning medium provided students with opportunities to analyze and conclude to common ideas cooperatively. The classroom setting facilitated discussion and interaction. This group interaction helped students to learn from each other's experiences. The ability to accept each one's opinion led them to work in collaboration. It can be concluded that collaborative learning fosters the development of language skills, critical thinking and overall achievement through discussion, clarification of ideas, and accepting others' ideas. Thus collaborative learning is beneficial to the students.
8.		Nick Bostrom and Eliezer Yudkowsky	The Ethics of Artificial Intelligence	It is evident that the social roles may be filled by AI algorithms, implying new design requirements like transparency and predictability. Sufficiently general AI algorithms may no longer execute in predictable contexts, requiring new kinds of safety assurance and the engineering of artificial ethical considerations.

				AIs with sufficiently advanced mental states, or the right kind of states, will have moral status, and some may count as persons—though perhaps persons very much unlike the sort that exist now, perhaps governed by different rules
9.	2009	Sangeeta Goswami	A study of the effect of life skills training on adolescent school students	The results and findings of the Life Skills Training Programme reflect that there were significant positive changes quantitatively as well as qualitatively from pre-training to post-training after the Life Skills Training Programme for adolescent school students.

After going through all these literature, the researcher observed that most of the researches have been done on impact of artificial intelligence on teaching and learning in higher education, life skills among senior secondary school, collaborative learning effect on students with special needs and ethics of artificial intelligence.

So, the researcher has taken up this study on life skills, collaborative skills and ethical awareness in relation with artificial intelligence course of secondary school.

OPERATIONAL DEFINITIONS

The operational definitions of terms used in the study are as follows:

PRESCRIBED ARTIFICIAL INTELLIGENCE (AI) COURSE -

According to Merriam - Webster Dictionary

ARTIFICIAL INTELLIGENCE (AI) IS

- a branch of computer science dealing with the simulation of intelligent behaviour in computers
- the capability of a machine to imitate intelligent human behaviour

According to Cambridge English Dictionary

The study of how to make computers that have some of the qualities of the human mind, for example the ability to understand language, recognize pictures, solve problems, and learn.

According To Oxford Dictionary

Artificial Intelligence (AI) as the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.

In the proposed study, the term 'Artificial intelligence (AI) Course' denotes the Artificial Intelligence Course prescribed by CBSE for class IX, which has been designed to develop an understanding and appreciating Artificial Intelligence and its application in students' lives.

LIFE SKILLS–

Life Skills Education as defined by UNICEF is

"A behaviour change or behaviour development approach designed to address a balance of three areas; knowledge, attitude and skills".

In the proposed study, the term 'Life Skills' denotes ten core life skills which are listed by the world bodies such as UNICEF, UNESCO and WHO includes Empathy, Self - Awareness, Building Skills, Creative Thinking, Problem Solving, Decision Making, Effective Communication, Interpersonal Relationship Skills, Coping with Stress and Coping with Emotions.[21]

COLLABORATIVE SKILLS–

Collaborative skills are the behaviors that help two or more people work together and function well in the process. Teachers can train their students in the skills of collaboration so they will be able to accomplish group tasks, not just in the classroom but also in work settings, social settings and other aspects of life.[6]

In the proposed study, the term 'Collaborative Skills' denotes skills required in students to combinedly perform theme based research and various case studies by imaging, examining and reflecting.

ETHICAL AWARENESS –

Ethical awareness is the willingness and ability to identify moral and ethical contexts and dilemmas; critically examine, assess, and/or change one's own ethical values; and examine the implications of one's own behavior for the lives of others.[19]

In the proposed study, the term 'Ethical Awareness' denotes awareness among secondary students to understand and reflect on ethical issues around artificial intelligence.

SECONDARY SCHOOL STUDENTS –

In the proposed study 'Secondary School Students' denotes students of class IX of CBSE Board School. Which covers students of age group between 14-16 years.

OBJECTIVES OF THE STUDY

The study will be undertaken in the light of following objectives:

1. To determine the impact of artificial intelligence course on life skills of secondary school students.
2. To evaluate the impact of artificial intelligence course on collaborative skills of secondary school students.
3. To study the impact of artificial intelligence course on ethical awareness of secondary school students.
4. To study the opinion of students, teachers, parents and administrators regarding artificial intelligence course of secondary school students.

HYPOTHESES OF THE STUDY

Following non – directional hypotheses have been framed for the study:

1. There will be significant impact of artificial intelligence course on life skills of secondary school students.
2. There will be significant impact of artificial intelligence course on collaboration skills of secondary school students.
3. There will be significant impact of artificial intelligence course on ethical awareness of secondary school students.

DELIMITATION OF THE STUDY

The study will be delimited in the following respects:

1. The present study will be delimited to the Agra and Aligarh cities.
2. The present study will be delimited to the CBSE Board schools.
3. The present study will be delimited to IX class students.

4. The study will be delimited to three components of the artificial intelligence course i.e. life skills, collaborative skills and ethical awareness.
5. The present study will be delimited to 300 students of IX class.
6. The present study will be delimited to 80 teachers, 80 parents and 40 administrators.

VARIABLES OF THE STUDY

The variables of study have been classified as follows:

1. **Independent Variable:** In the present study artificial intelligence course has been taken as an independent variable.
2. **Dependent Variable:** In the present study life skills, collaborative skills and ethical awareness will be dependent variable.
3. **Control Variable:** In the present study school board, teaching facilities such as computer lab will be control variable

METHODOLOGY OF THE STUDY

The methodology of the study has been stated in the following head:

Research Method of the study

Method is a way or style of conducting a research work and is considered according to the nature of the problem. Keeping in view the nature of the problem, the researcher will adopt Descriptive Survey Method. In descriptive survey method, participants answer questions administered through interviews or questionnaires. After participants answer the questions, researchers describe the responses given. In order for the survey to be both reliable and valid it is important that the questions are constructed properly. Questions should be written so they are clear and easy to comprehend.

SELECTION OF THE SAMPLE

The process of sample selection is given below:

1. **Population –**The researcher will select secondary school students i.e. class IX students of CBSE Board, teachers, parents and administrators for the research work.
2. **Sample –**A sample is a representative part or a single item from a larger whole or group especially when presented for inspection or shown as evidence of quality. The researcher will apply the

'Purposive Sampling' to select the CBSE Board Schools for the study. 300 sample units of secondary school students, 80 teachers, 80 parents and 40 administrators will be selected by random method.

3. **Sampling Procedure -**

All the students, teachers, parents and administrators will be the population for the study. Out of which three of the CBSE Board Schools of Agra and Aligarh cities each will be selected by purposive sampling for the study. Then for sample (N = 500) which includes students, teachers, parents and administrators of these selected CBSE Board Schools will be considered. This sample of 500 includes 250 from Agra city (i.e. 150 students, 40 teachers, 40 parents and 20 administrators) and 250 from Aligarh city (i.e. 150 students, 40 teachers, 40 parents and 20 administrators). This sample of 500 will be selected by random method.

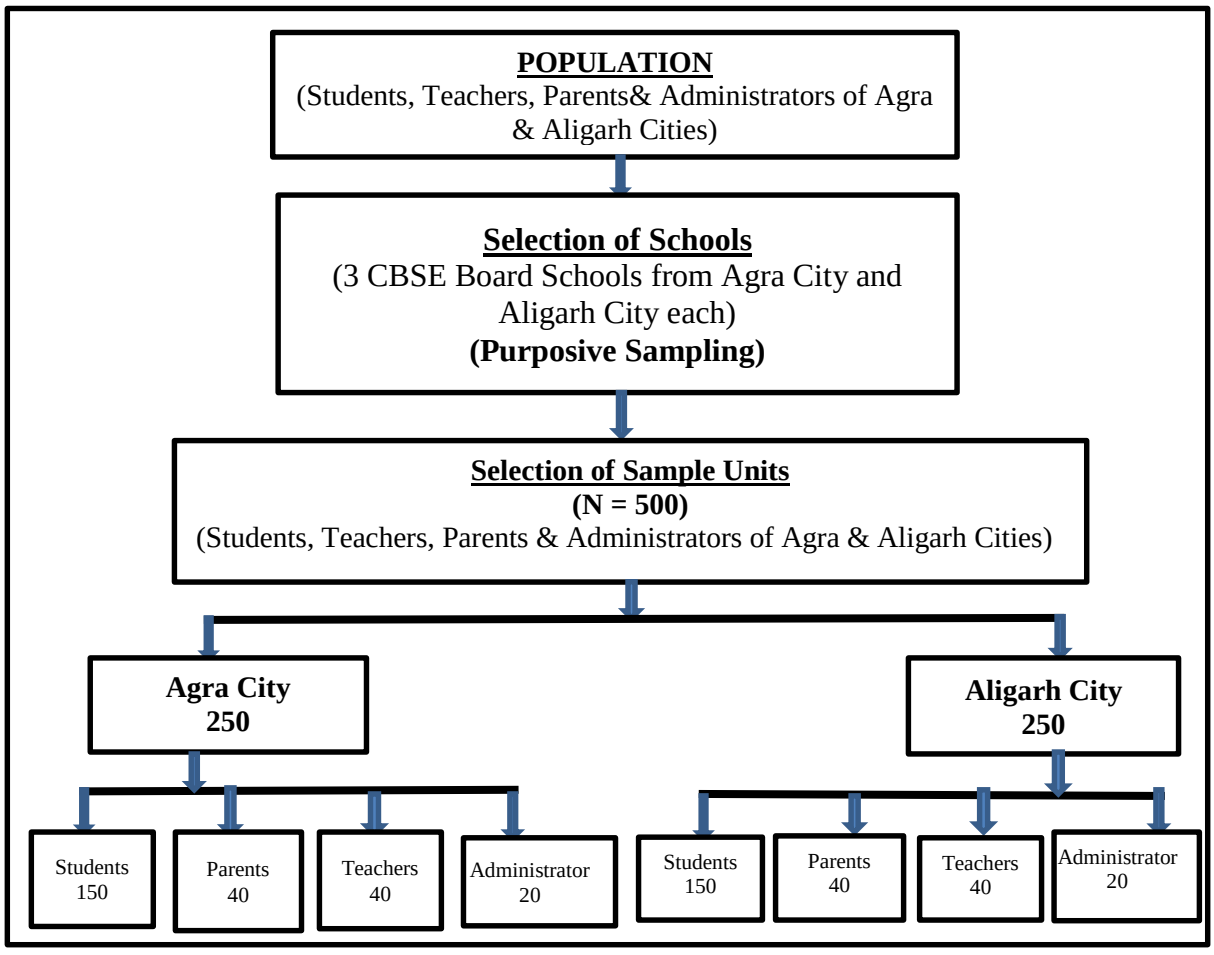

Figure 1:Sampling Procedure

TOOLS AND MATERIAL OF THE STUDY

In order to attain the objectives of the study following tool will be used:

Life skills – Questionnaires with attached rating scale for assessing life skills would be developed by the researcher. Which will be administered on students.

Collaborative Skills – Self – constructed questionnaire with attached rating scale will be developed by the researcher for assessing the ethical awareness related to artificial intelligence. Which will be administered on students.

Ethical Awareness – Self – constructed questionnaire with attached rating scale will be developed by the researcher for assessing the ethical awareness related to artificial intelligence. Which will be administered on students.

Collecting Opinion on Artificial Intelligence Course –Self – Constructed opinionnaire with attached rating scale will be developed by the researcher for assessing opinions. Which will be collected from students, teachers, parents and administrators.

STATISTICAL TECHNIQUES

The following parametric statistical techniques will be used to analyze, interpret and draw the conclusion from the data:

I. Mean
II. Standard Deviation (S.D.)
III. t - test
IV. One – way ANOVA

SIGNIFICANCE OF THE STUDY

Significance of the study has been stated in the following points:

For Students, Students will also be benefited from this study by knowing their improvement in their life skills, collaboration skills and ethical awareness by studying prescribed artificial intelligence as a course. The structure of artificial intelligence course will help in developing interest and enthusiasm of the student in their studies. Students will able to analyze their knowledge which is gain from the above mentioned course.

For Teachers, this study will be useful for updating themselves with the learning requirements of the students and do their teaching accordingly. Constructive participation of the students in the prescribed artificial intelligence course will allow a teacher to improve their teaching practices. Prescribed artificial

intelligence based course will also empowers teachers to help students on an individual basis and achieve high level of effectiveness in their own teaching.

For Administrators, Prescribed artificial intelligence course will allows them to assess and evaluate their teachers' teaching skills and knowledge in the course. They will also become acquainted with the current perceptions of the students related to prescribe artificial intelligence course.

For Course Developers, students' interest and knowledge generated through prescribed artificial intelligence course will allow them to understand the extent to which the objectives of content of the subject are achieved and also they may get an understanding for improvement required in the content of the subject by adding more explanation regarding the content or removing topics which are not required.

For Parents, this study will be useful to understand the progress of their wards and their understanding related to prescribed artificial intelligence course. Parents also come to know the coordination of their wards with the teachers' teaching them.

CONCLUSION

Through this study the researcher will analyze the improvement made in the secondary school curriculum with the help of prescribed artificial intelligence course and the interest level of the students' in the new course. The study will be helpful to find out the effect of prescribed artificial intelligence course on the life skills, collaboration skills and ethical awareness of secondary students. This study will also be helpful in identify whether the objectives of the course will be meet or not at the end of the session in which this course is implemented.

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